

Symposium: Companion Animals: Perceptions and Implications of Companion Animals in Research and Teaching - Domestically and Globally

414 ASAS Centennial Presentation: Evolution of companion animals - A perception shift. L. P. Case*^{1,2}, ¹*University of Illinois, Urbana*, ²*AutumnGold Consulting, Mahomet, IL*.

We are a nation of dog and cat lovers. Never before in our history have we spent more time, money, and emotional energy on a group of animals that are kept solely for companionship. Pet food sales are a multi-billion dollar industry and pet owners are spending more than 11 billion dollars each year on veterinary care. This devotion is further illustrated by the exponential growth of the pet supply industry, including increasing numbers of pet “super-stores”, play-parks, training centers, and doggie day care centers. During the 1980’s, recognition of the “human-animal bond” led to serious study of the roles that pets play in our lives. These studies have shown that pets provide significant benefits to our emotional, physical and social well being. Unlike any other non-human species, dogs and cats have become fully integrated into our lives and our hearts. It is ironic then, that at a time when we recognize and appreciate our bonds with animal companions, dark elements of this relationship are equally pervasive. Animal shelters in the United States kill between 3 and 4 million dogs and cats annually. Dog fighting, although outlawed, has reached epidemic proportions in some areas of the country. Colonies of feral cats are so prevalent that organizations are devoted completely to their advocacy. Episodes of animal cruelty and neglect are reported with alarming frequency in the media; so frequently that discussions of the connection between animal cruelty and human violence have become daily parlance. How then did we come to have such paradoxical perceptions and treatment of our animal companions? Facts and myths about our pets’ ancestries and the cultural changes that led to domestication will be presented. Motivations for and results of selective breeding practices that created pets with wildly differing appearances and temperaments are discussed. A review of our working relationships with dogs and cats and the evolution of those relationships into bonds of companionship provides an understanding of pets today and a basis for continuing the evolution of our relationship with our two “best friends”.

Key Words: Companion Animals, Domestication, Human-Animal Bond

415 Past-present perceptions and research in companion animals – A domestic viewpoint. G. Czarnecki-Maulden*, *Nestle Purina Research Center, St. Louis, MO*.

The objective of this presentation is to review the evolution of research in companion animals in the United States over the past fifty years and how it relates to the perception of pets, trends in human nutrition and progression of the pet food industry. Nielsen reports on market data, pet food labels and literature reviews for specific time periods were evaluated. Much of the early canine and feline nutrition research focused on defining nutrient functions. Often this research focused on the use of dogs and cats as models for humans. This lack of research on dogs and cats was reflected in the type of pet foods on the market. Fifty years ago, most pet foods were “one size fits all”. As dogs and cats became more valued members of the human family, interest in companion animal nutrition blossomed. Increasingly, research has focused on functional ingredients and improving quality of life and longevity. Research areas

often parallel those in human nutrition. New non-invasive methodologies have allowed the study of body systems and metabolic pathways previously unattainable. Along with the changing focus of companion animal nutrition research came a shift in where the research is conducted. Industry scientists published few studies 30-50 years ago and there were only a handful of companion animal nutritionists in academia or industry. Now most pet food companies have several nutritionists. As a result, pet foods have become increasingly specialized and nutritionally focused.

Key Words: Nutrition, Dog, Cat

416 Past-present perceptions and research in companion animals – An international viewpoint. P. Nguyen*¹, L. Prola², R. C. Nap³, P. P. Mussa², and J. Nery¹, ¹*National Veterinary School of Nantes, Nantes, France*, ²*Veterinary School of Turin, Turin, Italy*, ³*Uppertunity Consultants, Utrecht, The Netherlands*.

In Europe animal experiments are subdued to the European convention ETS 123 and the EU directive 86/609 both adopted in 1986. The directive provides a minimum framework for housing and care of research animals. It also aims to promote the 3Rs. States may adopt more stringent regulation, and animal rights organizations (AROs; with different levels of “activism”: from those who aim to promote animal interests or influence public attitudes towards animals, to those who recommend strong-arm methods, to free research animals, and to carry out economical sabotage) have played a role in influencing the public opinion and politicians towards animal welfare and the use of animals in research. Sweden adopted an Animal Welfare Act. In the Netherlands the Party for the Animals has 2 seats in parliament. In Italy to get an authorization for dog research may need having each animal adopted by a family. Bull fighting is authorized here while displaying lobster on ice is fined there...

In EU, dogs and cats represent only $\pm 0.23\%$ (28000 in 2005) of total research animals. This use has been decreasing over the last 15 years. Some countries do not use any dog or cat while 3 account for 65% of dogs used in EU and 2 for 60% of cats. The EU directive is under revision and it could be influenced by a lobby engaged on banning research on primates. No doubt that pet animals are on the second line.

Using pets to study their physiology and diseases can still make scientific sense but using them to study human diseases or experimenting on healthy animals and deliberately making them sick has become unacceptable. Some AROs reject any animal experiment, even food testing, due to the use of “cruel and unethical” methods with the only objective of marketing edge. Some even publish lists of brands recommended or to boycott. More than direct effect on public opinion, this can strongly influence research definition and funding. Pet research has been reduced by improved access to information. Invasive protocols have been strongly restricted. Funding is driven by citation indexes, evidence of need, and optimal ratio between research benefit and disagreement for research animals.

Key Words: Companion Animals, Animal Research, Europe

417 Evolution of regulatory issues in companion animals. S. L. Traylor*, *Alltech, Inc., Nicholasville, KY.*

The evolution of food for companion animals is relatively short compared with the domestication of companion animals. Until commercial pet food grew in popularity, dogs ate whatever was available in their environment. This might have included meat scraps, raw milk, or eggs. In 1860, James Spratt developed the first processed dog biscuit and more than likely, sparked interest in regulatory and consumer related issues. During the early years, a small number of companies marketed pet food; however, they were not without their problems. Demand for these products was not high and the consumer often found the contents green with mold or rancid. Interestingly, it was about fifty years later that the first Federal Food Law was promulgated. The Pure Food and Drug Act of 1906 bill was rewritten in 1938, as amended, this is today's law and provides protection for man and animal. In parallel with Federal Law, the Association of American Feed Control Officials was formed and they quickly became the regulatory authority at the state level for labeling compliance. Although modern pet food formulations have become more complicated, the labels of the Depression Era have not changed much from those of today. Most regulatory authorities speculate that the information on the label is not likely to change significantly. However, at the date of submission, there are whole host of "safety" bills that have been introduced in Congress. These bills aim to provide the FDA, USDA and other agencies with new food safety authorities and responsibilities. One bill that was signed into law, the Food and Drug Administration Amendments Act (FDAAA), requires the FDA to promulgate rules in two years that will create ingredient standards, process control requirements, updated labeling and additional nutritional information for pet foods. The era of voluntary regulatory compliance is dated and the regulatory environment for the animal and pet food industry will require additional resources to implement the new feed safety regulations that are inevitable.

Key Words: Companion Animal, Regulatory, Feed Safety

418 Trends in pet food safety. R. Johnson*, *Private Pet Food Consultant.*

In the spring of 2007, the North American pet food industry experienced the most dramatic product recall in its history. Due to the number of pet food brands involved and intense media coverage, Congressional inquiries were generated as to the manner in which the safety of pet foods could be compromised. The basis for this massive recall was investigated by Federal and State agencies which determined that adulterated vegetable protein products coming from China contained melamine. Public and media attention to this recall exceeded anything that the Federal Drug Administration (FDA) had ever experienced. The result of these Congressional Hearings was a mandate for the implementation of a comprehensive feed safety program. The FDA has been directed by Congress, under the Federal Drug Administration Amendment Act (FDAAA), to develop a Food/Feed Safety Program. The FDAAA will create a reportable food registry for FDA regulated products. Within two years the FDA is to enact ingredient standards/definitions, processing standards, and a reportable food registry. The FDA and the American Association of Feed Control Officials (AAFCO) signed a Memorandum of Agreement to work together in development of the goals of FDAAA. In December 2007, the FDA signed a Memorandum of Understanding with China to exchange, investigate, and pursue feed safety issues. Congressional House Bills for 2008 are seeking required CGMP/

HACCP process control regulations for all foods and feed within two years. They would also increase civil monetary penalties and establish private rights of litigation. Items that can be expected for pet food safety will be the establishment of CGMP, where risk warrants; authorized increase in FDA inspections, based upon risk; FDA authorization of accredited third party inspections; expanded research and diagnostic laboratory activities related to improved food safety; modernization of computer systems for Federal Departments and Agencies for exchange of information on importers and shipments; authorization by the FDA for establishment of overseas inspection of high risk imports; and the utilization of third party inspectors.

Key Words: Pet Food, Food Safety, FDA

419 Alternatives to live animal models in companion animals: Research location shift. G. Kuhlman* and M. A. Tetrick, *Procter & Gamble Pet Care Research & Development, Lewisburg, OH.*

There are multiple options to consider for alternatives to current live companion animal testing methodologies. These options include refining the research environment, reducing the number of animals used or replacing the animal model. This presentation will focus on the refinement of the research setting as well as the shift from research environments into privately owned companion animals in the home. These refinements provide greater access to the five freedoms and are steps along the continuum to replacement alternative methods.

In considering housing refinements for felines, automated urine and fecal collection systems have been developed. These systems allow for social housing and interactions among groups of cats while still allowing individual feeding and individual identified collection of fecal and urine samples. Additionally, careful adaptation and acclimation of cats to research procedures such as blood sampling have been developed that allow for minimal restraint and greatly reduce stress for the cats and reduce the risk of injury for veterinary personnel. Similarly for dogs, implementation of paired housing allows conspecific species interaction but requires careful oversight and management as well as refinement of research procedures to be successful.

Shifting the location of dogs and cats participating in research studies to the home and veterinary clinic has been successfully accomplished. Clinical research in collaboration with veterinarians allows enrolling dogs or cats with preexisting clinical conditions to evaluate dietary interventions e.g. renal failure, diabetes, osteoarthritis, etc. Methods such as split plate preference studies typically run in the research setting can be adapted to be conducted by the pet owner in the home. While there are limitations that come with this location shift it also affords flexibility to recruit specific breeds, age groups, and health conditions and provides the ability to expand or contract capacity reducing overhead when not engaged in research. Application of these refinements has the potential to enhance welfare and facilitate research.

Key Words: Alternative Methods, Canine, Feline

420 Alternative systems for evaluating digestion in companion animals. D. L. Harmon* and M. R. C. de Godoy, *University of Kentucky, Lexington.*

To enable accurate diet formulation the ability to predict the behavior of individual feed ingredients is needed. This requires knowledge of

digestion and absorption of nutrients contained in these ingredients which is usually obtained in animal feeding studies. It is not possible to evaluate every ingredient source in animal studies, thus assays for comparing ingredients are widely used to estimate ingredient quality. This is particularly true in regards to amino acid and mineral bioavailability. Models that have been directly compared with the dog and cat include the cecectomized rooster, protein efficiency ratio in chicks, the blue fox, the mink and the rat. The rooster assay had very high correlations ($r = 0.87$ to 0.92) for individual amino acid digestibilities with values obtained in the dog indicating that it was a useful means of predicting nutrient availability in the dog. In vitro systems for determining digestibility have also been developed. These range from complex, multi-compartment, computer controlled systems to enzyme-test tube assays. Their application to pet foods has been limited; however, high correlations with in vivo digestion have been reported. One problem described when evaluating commercial pet foods is the narrow range of results obtained, thus making the development of an accurate prediction model difficult. Fermentation systems have been used based on fecal inoculum from both dogs and cats; however, the application has been limited to characterization of dietary fiber or other ingredient sources. Their application to complete diets is limited.

Key Words: Fermentation, In vitro, Digestion

421 Computer modeling: An alternative to live companion animal testing. R. M. Yamka* and N. Z. Frantz, *Hill's Pet Nutrition, Inc., Topeka, KS.*

In recent years, the pet food industry has been striving to refine, reduce and replace animal testing through alternative methods. Methods of alternative testing can include both in vitro and/or computer modeling. The aim of this review is to gain a fundamental understanding in how computer models are typically developed and the types of models available to the pet food industry today. The models discussed in this review will include urine pH, digestibility, metabolizable energy, stool quality and body composition. Since most of the models available today utilize the nutrient composition of the foods for prediction, this review will discuss how the incorporation of some of these models into food formulation can result in the reduction of time and costs associated with getting foods to market.

Key Words: Dog, Cat, Computer Modeling

422 ASAS Centennial Presentation: The future of teaching and research in companion animal biology in departments of animal sciences. J. McNamara*, *Washington State University, Pullman.*

Departments of Animal Sciences must be relevant to a society in which a small number of people can raise all the animal products needed. While involvement in animal agriculture has declined, lowering enrollments in many Departments, several of these adapted by seeking out and welcoming students from a diverse background. This is not a new trend, as research and teaching about pets dates to the 1940's. The adaptation was spotty and not without some 'discussion'. The future is now, and in most states, the undergraduate curriculum depends on having a number of students interested only in companion animals. A benefit is that we can often recruit 'new blood' into agriculture, and students have gone and will go on to excellent careers in agriculture. We have a new challenge: how to maintain and expand the efforts in both teaching and research. Departments wishing to expand in teaching have examples of successful courses and curricula from other departments that they can use. Some departments have, and others should, expand their teaching across their university to teach about pets to a wider audience than their own majors. In research, a small number of faculty have been able to establish extramurally funded projects on pets. Horses are included in this effort, and several departments have excellent equine programs. But it will be difficult for more than a handful of departments to have a serious research effort in dogs, cats, birds, fish or exotic animals. Departments will have to make a concerted effort to invest in such endeavors, joint ventures with other Universities and Colleges of Veterinary Medicine (or Medicine) will probably be required. Funding sources for traditional efforts in nutrition, reproduction, physiology, etc. are small and inconsistent; however, with the progress of the canine, and now feline, genome project, there should be opportunities from federal funding sources aimed at using animal models for human health. In addition, efforts in animal behavior and welfare can be expanded, perhaps with some funding from private foundations or animal-supportive organizations.

Key Words: Companion Animals, Research, Teaching